## Unit 6 Lesson 8: Equations and Graphs

### 1 Focus on Distance (Warm up)

#### Student Task Statement

The image shows a parabola with focus $\left(-2,2\right)$ and directrix $y=0$ (the $x$-axis). Points $A$, $B$, and $C$ are on the parabola.



Without using the Pythagorean Theorem, find the distance from each plotted point to the parabola’s focus. Explain your reasoning.

#### Activity Synthesis



### 2 Building an Equation for a Parabola

#### Student Task Statement

The image shows a parabola with focus $\left(3,2\right)$ and directrix $y=0$ (the $x$-axis).



1. Write an equation that would allow you to test whether a particular point $\left(x,y\right)$ is on the parabola.
2. The equation you wrote defines the parabola, but it’s not in a very easy-to-read form. Rewrite the equation to be in vertex form: $y=a\left(x−h\right)^{2}+k$, where $\left(h,k\right)$ is the vertex.

### 3 Card Sort: Parabolas

#### Student Task Statement

Your teacher will give you a set of cards with graphs and equations of parabolas. Match each graph with the equation that represents it.

#### Images for Activity Synthesis







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